Math 110 Section 17

Quiz 2   Name _____

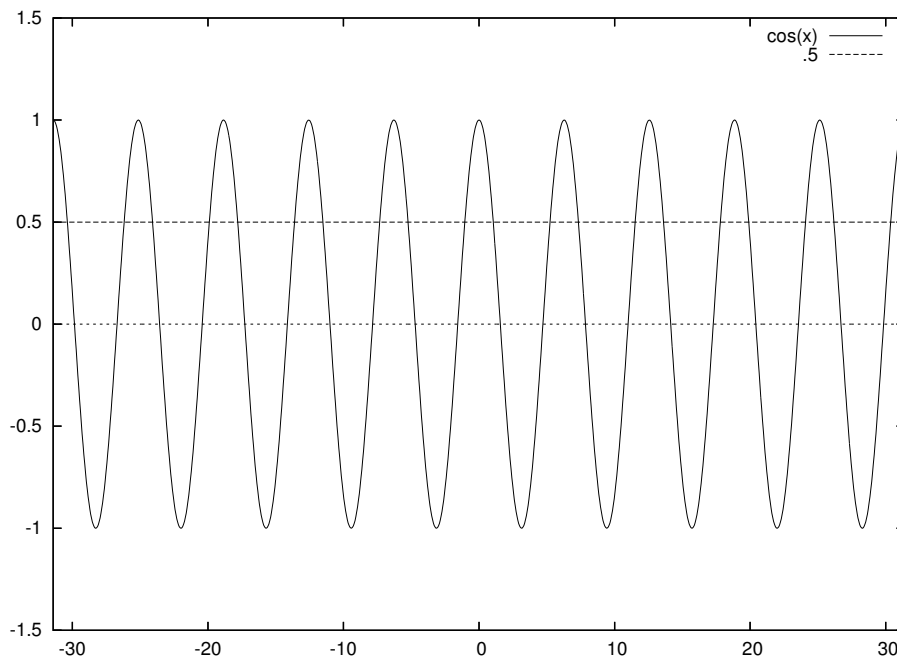September 26, 2005

Instructor: Charles Cuell   Student Number _____

All solutions are to be presented on the paper in the space provided. The quiz is open book. You can discuss the problem with others and ask the TA questions.

(1) Solve the following inequality on all of $\mathbb{R}$: $2\cos x - 1 > 0$.

Rewrite as $\cos x > \frac{1}{2}$. The graph of $\cos x$ lies above the line $y = \frac{1}{2}$ when $x \in (-\frac{\pi}{3}, \frac{\pi}{3})$. Since $\cos x$ repeats itself every 2π, the solution interval will also repeat itself every 2π. So $\cos x > \frac{1}{2}$ for every interval of the form $(-\dfrac{\pi}{3} + 2\pi n, \dfrac{\pi}{3} + 2\pi n)$, where n is any integer.

In the picture below, the solution set corresponds to all the x values such that $\cos x$ is above the upper line.

(2) Find the domain of $f(x) = \sqrt{x+1} + \dfrac{1}{x+1}$.

Because of the square root, we require $x + 1 \geq 0$. However, $x + 1$ also shows up as the denominator of a fraction, so we need $x + 1 > 0$. Therefore, $D_f = (-1, \infty)$.